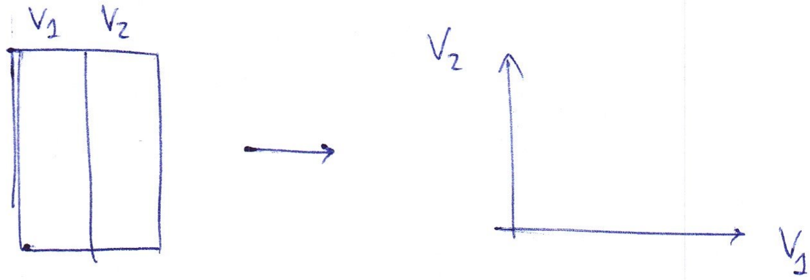
NOTE:



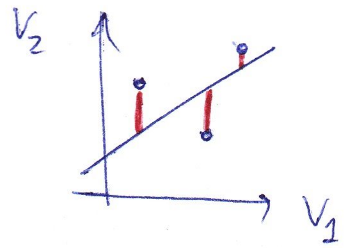
We're explaining V_2 in terms of V_1

$lm(V_2 \sim V_1)$: $V_2 = \beta_0 + \beta_1 V_1 + \varepsilon$

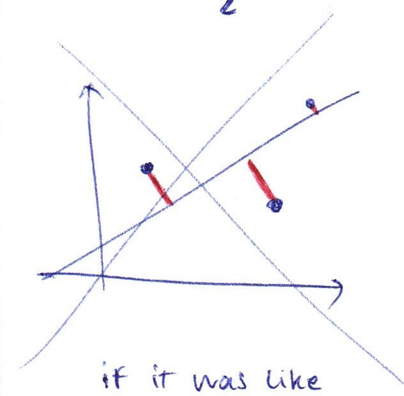
If we want now to explain V_1 in terms of V_2 we <u>can't</u> do

$$\cancel{V_1 = \frac{1}{\beta_1}(V_2 - \beta_0) + \varepsilon}$$

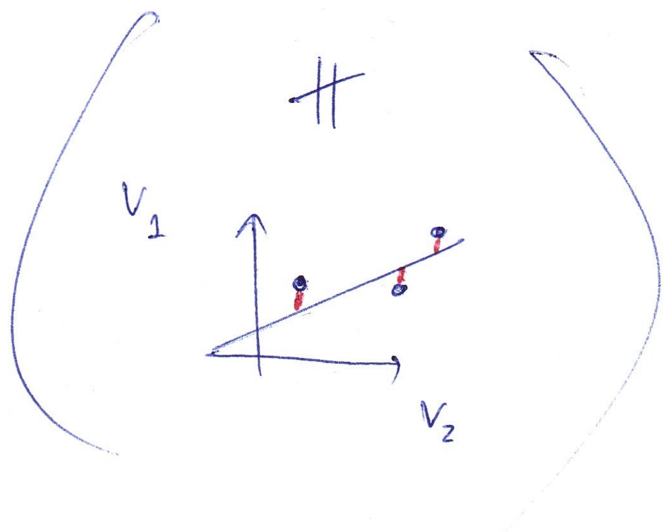
BECAUSE the β_j are evaluated in a way s.t. they minimize the distance between the residuals of V_2



, it's not:



if it was like that it would have been ok



It's important to choose which one is the independent variable

$\alpha =$ how strongly the sample evidence must contradict H_0 before we can reject H_0 for the whole population.
The strength of the evidence is $\mathbb{P}(\text{reject } H_0 \mid H_0 \text{ is true})$

$\alpha = 0.05 \Rightarrow$ 5% of deciding that an effect exists when it doesn't

~~α ↑ stronger sample evidence~~

$\alpha \downarrow$ requires $\left(\text{sample evidence to be able to reject } H_0\right) \uparrow$

error I type = H_0 **T** rejected
error II type = H_0 **F** accepted

~~Hypothesis testing~~

Hypothesis tests based on statistical significance are another way to express confidence intervals (more precisely confidence sets.
Every hypothesis test based on significance can be obtained via confidence interval, and every confidence interval can be obtained via hypothesis test based on significance.

Testing process :

1. H_0 vs H_1
2. **T** statistic (test statistic)
3. **T** distribution under H_0
4. level α selection (probability trashold below which H_0 will be rejected)
5. Calculate t_{obs} (realization of **T** with our sample)
6. Calculate p-value : $\mathbb{P}(t \geq t_{obs} \mid H_0)$
7.

T distr